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107044-0002**IN THE CLAIMS:**

Claims 1-9 (Cancelled)

1 10. (Currently Amended) A method of regulating a concentration of methanol in a
2 direct methanol fuel cell system, the system including a direct methanol fuel cell being
3 used to provide power to an application device, comprising the steps of:
4 using a detector to sense changes in an output power level of said fuel cell and producing
5 a signal indicative of said changes; and
6 using said signal to drive a concentration regulator which responsively controls
7 the amount of methanol supplied to said fuel cell's anode in response to changes
8 sensed in said output power level.

1 11. (Original) The method as in claim 10 wherein said concentration regulator is
2 constructed using MEMS fabrication techniques.

1 12. (Currently Amended) [[The method as in claim 11 wherein]] A method of regu-
2 lating a concentration of methanol in a direct methanol fuel cell system, including a direct
3 methanol fuel cell, comprising the steps of:
4 using a detector to sense changes in an output power level of said fuel cell and producing
5 a signal indicative of said changes; and using said signal to drive a concentration regula-
6 tor which responsively controls the amount of methanol supplied to said fuel cell's anode
7 in response to changes sensed in said output power level, said concentration regulator
8 [[comprises]] comprising a microactuator mechanically coupled to said anode and oper-
9 able in response to said detector to increase or decrease a flow of methanol to said anode.

1 13. (Original) The method as in claim 12 wherein said microactuator comprises
2 an enclosed chamber mechanically coupled to a flow plate which supplies methanol to

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3 said anode, said chamber being filled with a control liquid in which a resistive element is
4 disposed, said resistive element operable in response to said detector to heat said liquid
5 and thereby exert pressure on said flow plate, whereby the flow of methanol to said anode
6 is varied.

1 14. (Currently Amended) The method as in claim [[11]] 12 wherein said concentra-
2 tion regulator comprises a microactuator integrated with said anode.

1 15. (Currently Amended) The method as in claim [[11]] 12 wherein said concentra-
2 tion regulator comprises a microactuator mechanically coupled to a gas diffusion layer
3 and operable in response to said detector to increase or decrease a flow of methanol to
4 said anode.

1 16. (Currently Amended) The method as in claim [[11]] 12 wherein said concentra-
2 tion regulator comprises a microactuator integrated with a gas diffusion layer and oper-
3 able in response to said detector to increase or decrease a flow of methanol to said anode.

1 17. (Original) The method as in claim 10 wherein said concentration regulator is
2 constructed using non-MEMS fabrication techniques.

1 18. (Original) The method as in claim 10 wherein said concentration regulator is
2 constructed using a combination of MEMS and non-MEMS fabrication techniques.

Claims 19-27 (Cancelled)

1 28. (Currently Amended) A method of regulating a concentration of fuel in a direct
2 oxidation fuel cell system, including a direct oxidation fuel cell being used to pro-
3 vide power to an application device, comprising the steps of:
4 sensing changes in potential at an anode or load level of said fuel cell system; and

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5 using said sensed changes in potential to drive a concentration regulator which re-
6 sponsively controls the amount of [[methanol]] fuel supplied to said fuel cell's
7 anode when said power level increases and decreases, thereby minimizing cross-
8 over of [[methanol]] fuel through said fuel cell's membrane electrolyte.

1 29. (Original) The method as in claim 28 wherein said concentration regulator is
2 constructed using MEMS fabrication techniques.

1 30. (Currently Amended) [[The method as in claim 29 wherein]] A method of regu-
2 lating a concentration of fuel in a direct oxidation fuel cell system comprising the
3 steps of:
4 sensing changes in potential at an anode or load level of said fuel cell system; and
5 using said sensed changes in potential to drive a concentration regulator which re-
6 sponsively controls the amount of fuel supplied to said fuel cell's anode when
7 said power level increases and decreases, thereby minimizing cross-over of fuel
8 through said fuel cell's membrane electrolyte, and said concentration regulator
9 [[comprises]] comprising a microactuator mechanically coupled to said anode and
10 operable in response to said detector to increase or decrease a flow of methanol to
11 said anode.

1 31. (Original) The method as in claim 30 wherein said microactuator comprises
2 an enclosed chamber mechanically coupled to a flow plate which supplies methanol to
3 said anode, said chamber being filled with a control liquid in which a resistive element is
4 disposed, said resistive element operable in response to said detector to heat said liquid
5 and thereby exert pressure on said flow plate, whereby the flow of methanol to said anode
6 is varied.

1 32. (Currently Amended) The method as in claim [[28]] 30 wherein said concentra-
2 tion regulator comprises a microactuator integrated with said anode.

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1 33. (Currently Amended) The method as in claim ~~[[28]]~~ 30 wherein said concentra-
2 tion regulator comprises a microactuator mechanically coupled to a gas diffusion layer
3 and operable in response to said detector to increase or decrease a flow of methanol to
4 said anode.

1 34. (Currently Amended) The method as in claim ~~[[28]]~~ 30 wherein said concentra-
2 tion regulator comprises a microactuator integrated with a gas diffusion layer and oper-
3 able in response to said detector to increase or decrease a flow of methanol to said anode.

1 35. (Original) The method as in claim 28 wherein said concentration regulator is
2 constructed using non-MEMS fabrication techniques.

1 36. (Original) The method as in claim 28 wherein said concentration regulator is
2 constructed using a combination of MEMS and non-MEMS fabrication techniques.

1 37. (Previously Presented) The method of regulating a concentration of metha-
2 nol in a direct methanol fuel cell system, as defined in claim 10, including the further step
3 of
4 when said detector senses a low output power level of said fuel cell and said con-
5 centration regulator indicates a high concentration of methanol, using said signal to drive
6 said concentration regulator to responsively decrease the amount of methanol supplied to
7 said anode thereby substantially minimizing cross-over of methanol through said fuel
8 cell's membrane electrolyte.

1 38. (Previously Presented) The method of regulating a concentration of metha-
2 nol in a direct methanol fuel cell system, as defined in claim 10, including the further step
3 of
4 when said detector senses a high output power level of said fuel cell and said con-
5 centration regulator indicates a low concentration of methanol, using said signal to drive

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6 said concentration regulator to responsively increase the amount of methanol supplied to
7 said anode thereby providing optimal methanol concentration while substantially mini-
8 mizing cross-over of methanol through said fuel cell's membrane electrolyte.

✓ 1 39. (Previously Presented) The method of regulating a concentration of metha-
2 nol in a direct methanol fuel cell system as defined in claim 28 including the further step
3 of

4 when a change in said potential of said fuel cell indicates an increase in a high
5 power operating fuel cell, and methanol concentration indicated by said concentration
6 regulator is low, using said signal to drive said concentration regulator to responsively
7 increase the amount of methanol supplied to said fuel cell's anode, to produce an optimal
8 amount of methanol being supplied to said anode, while substantially minimizing metha-
9 nol crossover.

NAB 1 40. (Previously Presented) The method of regulating a concentration of metha-
2 nol in a direct methanol fuel cell system as defined in claim 28 including the further step
3 of

4 when a change in said potential of said fuel cell indicates an increase in a
5 low power operating fuel cell, and methanol concentration indicated by said concentra-
6 tion regulator is high, using said signal to drive said concentration regulator to respon-
7 sively decrease the amount of methanol supplied to said fuel cell's anode, to substantially
8 minimize methanol crossover.

1 41. (Withdrawn) A method of regulating a concentration of methanol in a direct
2 methanol fuel cell system comprising the steps of:
3 providing a diffusion layer disposed between said anode and a source of metha-
4 nol; and

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5 varying a rate of diffusion of methanol through said diffusion layer, thereby con-
6 trolling a methanol concentration at said anode.

1 42. (Withdrawn) The method as in claim 41 wherein said rate of diffusion is varied
2 by compressing or decompressing said diffusion layer.

1 43. (Withdrawn) The method as in claim 41 wherein said rate of diffusion is varied
2 by changing a porosity of said diffusion layer.

1 44. (Withdrawn) The method as in claim 41 wherein said rate of diffusion is varied
2 by changing a tortuosity of said diffusion layer.
